UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/817,124	03/27/2001	Toshiyuki Sudo	2355.12213	8950

5514 7590 01/04/2005

FITZPATRICK CELLA HARPER & SCINTO
30 ROCKEFELLER PLAZA
NEW YORK, NY 10112

EXAMINER	
PAPPAS, PETER	
ART UNIT	**PAPER NUMBER**
2671	

DATE MAILED: 01/04/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/817,124	SUDO ET AL.	
	Examiner	Art Unit	
	Peter-Anthony Pappas	2671	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *10 November 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11,13 and 25-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,13 and 25-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 May 2004* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Specification

1. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter: "...forms intersections of a plurality of rays in the air..." (i.e. claim 1, lines 2-3); "...a controller for controlling said display panel..." (claim 28, lines 5-9, and claim 29, lines 1-5). See 37 CFR 1.75(d)(1) and MPEP § 608.01(o).

2. The specification is objected to because of the following informalities: "...the area board is shot together with the object..." (page 14, line 13). Said language "shot together" is considered unclear and should be changed to reflect the clarification previously made by the applicant, wherein said language "shot together" was changed to "imaged together".

Claim Objections

3. Claim 1 is objected to because said claim recites the limitation "...wherein the intersection of rays..." on line 3. There is insufficient antecedent basis for this limitation in the claim. The Office believes said limitation should have read "...wherein the intersections of rays..." and thus said language is considered to read as such for the purpose of art rejection.

Drawings

4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "a controller for controlling said display panel", as disclosed in claim 28, lines 5-9, and claim 29, lines 1-

5, must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

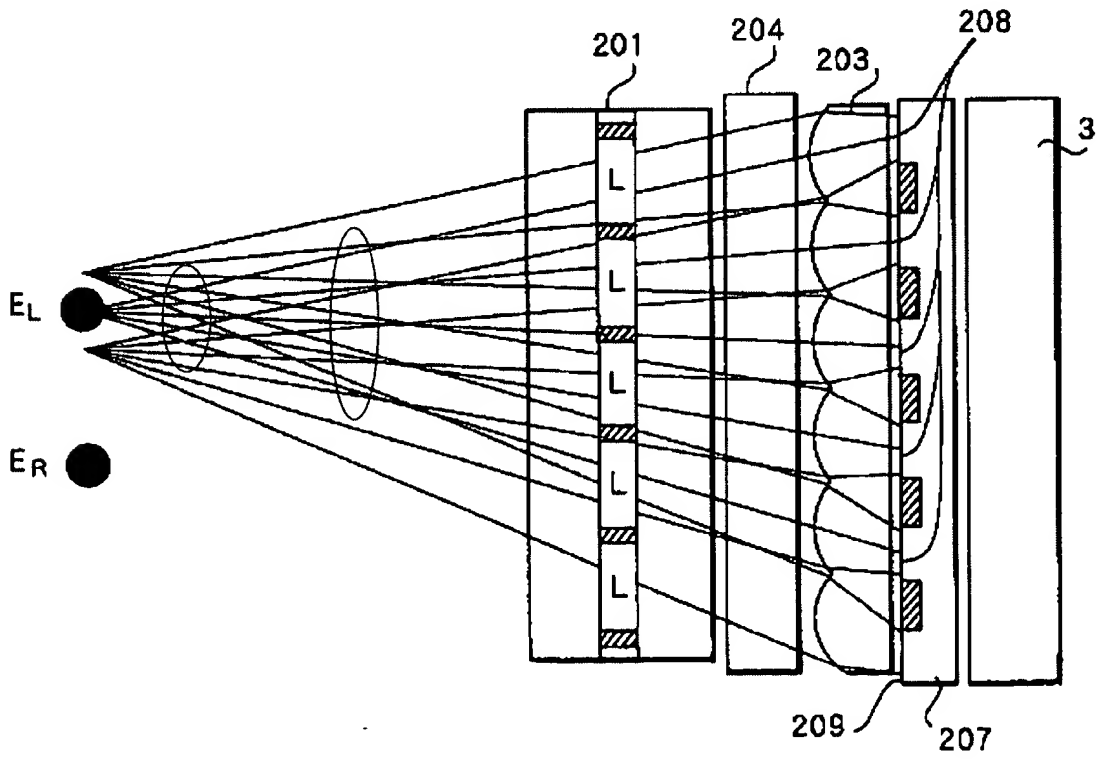
Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1-2, 5-6, 9-10, 13 and 26-28 are rejected under 35 U.S.C. 102(a) as being anticipated by Osaka et al. (U.S. Patent No. 6, 023, 277).

7. In regards to claim 1 Osaka et al. teaches a display control apparatus and a display control method (column 4, lines 43-50; column 23, lines 8-9; Fig. 23). At least two parallax images are divided up into pixels and are stored in horizontal stripes of a stripe image, which is used to generate a viewable stereoscopic image (column 24, lines 1-27; Figs. 24A-B). A display driver instructed by a host computer (3D image reproduction data generator) to perform a display operation uses an object analyzer to determine whether the file of an object to be displayed possesses 3D image data (Abstract).



Osaka et al. teaches a plurality of rays are directed (irradiated) by a stereoscopic image display device at an observer's one eye for the display of a stereoscope 3D image (column 23, lines 16-45), wherein said plurality of rays carrying image data intersect at a plurality of locations in air (Fig. 2; Fig. 22A-B) – see the figure above, wherein an example of said intersections, between elements E_L and 201, are circled to indicate their respective locations in space.

8. In regards to claim 2 Osaka et al. teaches that a 3D image is synthesized from a plurality of parallax images of a plurality of viewpoints (column 26, lines 40-43). Figs. 22A-B teach six blocks (ray sources) of mask 207, which are passed through lenticular sheets 40 and 41, in alignment with six respective pixel blocks of LCD 1 identified as R.

9. In regards to claim 5 Osaka et al. teaches the use of a mask pattern 207, which is a stripe image (column 24, lines 22-27, and Fig. 22A-B), wherein a stripe image is created by alternately arraying the stripe pixels obtained from parallax images (column 26, lines 47-54, and Figs. 24A-B). It is noted that a mask pattern 207, which is created through the combination of parallax image pixel data taken of a given object (the object), is considered an area board that limits the effective area for 3D representation of said given object, because the display of said 3D representation is limited (bound) by the dimensions of said mask pattern 207. As such the mask pattern 207 represents a combination of both said given object and its respective area as well as the respective relevant surrounding area of said object.

10. In regards to claim 6 it is inherent that a computer generated image, comprising of pixels, and displayed via a computer display device is considered to comprise of

virtual (not real, i.e. simulated real) space constructed via (on) a computer. The rationale disclosed in the rejection of claim 5, in regards to a stripe image, is incorporated herein.

11. In regards to claim 9 the rationale disclosed in the rejection of claim 2 is incorporated herein. It is noted that the single intersection point of rays at an observer's one eye is considered to be part of a plane and thus is considered located near the observer. Additionally, viewing points are considered the number of ray sources. Osaka et al. teaches the use of a mask pattern 207, which is a stripe image (column 24, lines 22-27; Fig. 22A-B), wherein a stripe image is created by alternately arraying the stripe pixels obtained from each of the parallax images (column 26, lines 47-54; Figs. 24A-B). The creation of said ray sources are thus dependent upon the stripe image, which is in turn dependent on the parallax images.

12. In regards to claim 10 Osaka et al. teaches a 3D image is synthesized from a plurality of parallax image of a plurality of viewpoints. Each parallax image is divided up into pixels, according to the respective parallax image being divided, and a stripe image is created by alternately arraying the strip pixels (column 26, lines 42-54; column 24, lines 22-27; Figs. 24A-B).

13. In regards to claim 13 the rationale disclosed in the rejection of claim 1 is incorporated herein.

14. In regards to claim 25 Osaka et al. teaches that it may be so arranged that the control program for implementing the processing procedure (described later) by way of

the CPU 11 is supplied from a storage medium such as a floppy disk and stored in a RAM (column 15, lines 10-13).

15. In regards to claim 26 the rationale disclosed in the rejection of claim 1 is incorporated herein.

16. In regards to claim 27 the rationale disclosed in the rejection of claim 1 is incorporated herein.

17. In regards to claim 28 the rationale disclosed in the rejection of claim 5, specifically in regards to mask pattern 207, is incorporated herein. Osaka et al. teaches the mask apertures in the cross section of FIG. 22A and the mask apertures in the cross section of FIG. 22B are formed complimentarily so that the mask pattern 207 (display panel) defines a checkerboard of apertures and light blocking portions (controlling light intensity) in addition to non-light blocking portions allow light to pass through (column 23, lines 25-50; Figs. 22A-22B). Osaka et al. teaches a mask pattern paint unit 8 (controller) controls the painting of the checkered mask pattern (column 14, lines 50-57; Fig. 8).

Claim Rejections - 35 USC § 103

18. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

19. Claims 3-4, 11 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osaka et al. (U.S. Patent No. 6, 023, 277), as applied to claims 1-2, 5-6, 9-10, 13 and 26-28.

20. In regards to claims 3 and 4 Osaka et al. fails to explicitly teach the clipping, through trimming, of an effective area (image representative of a 3D scene for display on a display) for generating said 3D image reproduction data and then stretching or shrinking said trimmed image.

It is well known to both clip and then resize an image, and thus it would have been obvious to one skilled in the art, at the time of the applicant's invention, to crop (clip/trim) a given image, wherein said image is representative of a 3D scene on a display device, and then resize (stretch or shrink) said cropped image respective to the view dimensions of said display device, because through cropping increased resolution of a given area of interest within said image can be achieved, resulting in enhanced clarity of said scene. Additionally through the utilization of resizing, post cropping, to said image one is able to achieve further increased viewability as the dimensions of the cropped image can be set to those dimensions, for example, of the display device so that the amount of the image desirable for being viewed is maximized regardless of the display device it is displayed on.

21. In regards to claim 11 the claim language appears to say nothing more then Q(m,n), a two-dimensional parallax image array, is assigned the value from P(m,n), a two-dimensional image array. Osaka et al. teaches a 3D image is synthesized from a plurality of parallax images of a plurality of viewpoints (column 26, lines 40-43). At least

two parallax images are divided up into pixels and are stored in horizontal stripes of a stripe image, which is used to generate a viewable stereoscopic image (column 24, lines 1-27; Fig. 24A-B).

It is well known to store image data in memory via such means as an array, wherein the dimensions of said array correspond to the dimensions of a given image represented by said image data, as well as to copy contents from one given array to another, based on the dimensions of said array, and thus it would have been obvious to one skilled in the art, at the time of the applicant's invention, to store a 2D image (i.e. a parallax image) in pixel form in a 2D image array, wherein the bounds of said array were based on width and height of the respective 2D image, because it is conventional to store digital images in memory in such a form as an array, wherein said array has dimensions corresponding to the levels of dimensions of the respective image data that is to be stored. Furthermore, it would have been obvious to one skilled in the art, at the time of the applicant's invention, to allow for the copying of image data between identically bounded (i.e. two-dimensional) arrays, because said copying would allow data from each array (i.e. pixel data) to more easily be copied to a corresponding location in the second array and thus would provide a secondary storage location (i.e. buffer) in memory for which to store said image while another image was loaded and stored in the original array.

22. In regards to claim 29 Osaka et al. fails to explicitly teach wherein a controller associates each light source with a coordinate of each pixel on the parallax images according to coordinates of the viewpoints where the parallax images are obtained, and

coordinates of the light sources and colors and intensities of rays emitted from the light sources to the viewpoints are based on the colors and brightness of corresponding pixels.

It is well known that when image data, comprising of pixels, contains color and intensity (brightness) information to maintain said properties when said image data is emitted via light rays, for display, from a given display device, and thus it would have been obvious to one skilled in the art, at the time of the applicant's invention, to maintain said properties throughout the display process, wherein said display process involves emitting light rays to a given user (i.e. to their eyes), because by maintaining said information the data integrity for said image is maintained and thus accurately display for said given user, rather then distorted if said properties were, for example, discarded during the emitting of said image.

23. In regards to claim 30 the rationale disclosed in the rejection of claims 2 and 29 are incorporated herein.

24. Claims 7-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Osaka et al. (U.S. Patent No. 6, 023, 277), as applied to claims 1-2, 5-6, 9-10, 13 and 26-28, in view of Ishikawa et al. (U.S. Patent No. 6, 549, 650 B1).

25. In regards to claim 7 Osaka et al. teaches that in addition to the display of 3D stereoscopic images, 2D images can be also viewed in the same manner as presented by an ordinary 2D display (column 19, lines 46-50). It is noted that the means by which this switching of display modes is accomplished varies according to the embodiment. Osaka et al. teaches a 3D image is synthesized from a plurality of parallax images of a

plurality of viewpoints (column 26, lines 40-43). However, Osaka et al. fails to explicitly teach the locations of the viewing points move in the imaging system such that the optical axis (lens) of the imaging system will move in parallel. Ishikawa et al. teaches, through prior art, two able to be rotated image sensing optical systems 6701a and 6701b, which are set to have no convergence and as such are set parallel to each other. It is noted that the optical axis for a respective image sensing optical system is considered to be defined by the orientation of its lens. Ishikawa et al. teaches that a system such as the one shown in Fig. 1, with parallax d and no convergence, is best suited for the display of stereoscopic display (column 3, lines 1-67, and column 4, lines 1-62). Thus, for best viewability for stereoscopic images one would ideally want no convergence and parallax to be present in a given system.

It would have been obvious to one skilled in the art, at the time of the applicant's invention, to utilize image sensing optical systems as taught Ishikawa et al. in the system disclosed by Osaka et al. for the capture of parallax data used to display 3D stereoscopic images, because by utilizing an orientation of image sensing optical systems as taught by Ishikawa et al. one would achieve a greater quality of captured data with parallax, which could be captured, and used for the display of 3D stereoscopic images created from said data thus improving the overall quality of said 3D stereoscopic images when displayed.

26. In regards to claim 8 Osaka et al. teaches that in addition to the display of 3D stereoscopic images, 2D images can be also viewed in the same manner as presented by an ordinary 2D display (column 19, lines 46-50). It is noted that the means by which

this switching of display modes is accomplished varies according to the embodiment. Osaka et al. teaches a 3D image is synthesized from a plurality of parallax images of a plurality of viewpoints (column 26, lines 40-43). Osaka et al. fails to explicitly teach the locations of the viewing points move in the imaging system such that the optical axis (lens) of the imaging system will always pass through the center of said effective area. Ishikawa et al. teaches, through prior art, two able to be rotated image sensing optical systems 6701a and 6701b, which are set to have convergence and are rotated by an amount defined by said convergence. It is noted that the optical axis for a respective image sensing optical system is considered to be defined by the orientation of its lens. Ishikawa et al. teaches that a system such as the one shown in Fig. 2, with convergence and no parallax, make obtaining a stereoscopic not possible (column 3, lines 1-67, and column 4, lines 1-62). Thus, for best viewability for non-stereoscopic images one would ideally want no parallax and convergence to be present in a given system.

It would have been obvious to one skilled in the art, at the time of the applicant's invention, to utilize image sensing optical systems as taught Ishikawa et al. in the system disclosed by Osaka et al. for the capture of data used to display 2D images, because by utilizing an orientation of image sensing optical systems as taught by Ishikawa et al. one would be able to achieve a greater quality of data without parallax and thus without stereoscopic features to be captured and used for the display of 2D images created from said data thus improving the overall quality of said 2D images when displayed.

Response to Arguments

27. In response to applicant's remarks regarding the rejection of claim 29 under 35 U.S.C. 112 first paragraph, said rejection has been withdrawn after further consideration.

28. In response to applicant's remarks regarding the objection of claim 29 said objection has been withdrawn in lieu of said remarks.

29. In response to applicant's remarks that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., resulting intersections of the rays form a contour of a projected image) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

30. In response to applicant's remarks that the neither Osaka et al. and Ishikawa et al. teach generation of 3D object images it is noted that the generation and display of a stereoscopic images are considered the generation and display of a 3D images. Furthermore, applicant discloses on page 11 that Ishikawa et al. teaches a stereoscopic display with a lenticular lens or liquid crystal shutter spectacles is used to generated 3D object images. This is in contradiction to applicant's prior statement.

Osaka et al. teaches that a display driver, instructed by a host computer to perform a display operation, uses an object analyzer to determine whether the file of an object to be displayed possesses 3D image data. If the file possesses 3D image data, then the display drive instructs a screen controller to present a 3D display (Abstract).

Ishikawa et al. teaches that the output means outputs the plurality of image signals so that individual images of the plurality of image signals are arranged on a display screen of 3D display means of a computer. A 3D image can also be transmitted to an external 3D computer display by outputting the right and left images which are set spatially (column 7, lines 23-30).

31. In response to applicant's remarks that since the left and right images are separated, there are not intersections of rays that are recognized as a 3D image by an observer, Osaka et al. teaches a plurality of intersections of rays, which together are recognized as a 3D image by an observer (Figs. 22A-22B).

32. In response to applicant's remarks that it is the images on the display that the observer recognizes as a 3D image, not the intersections of a plurality of rays in the air, Osaka et al. teaches a plurality of intersections of rays directed at a given observer's eyes, wherein said rays are representative of data for the display of 3D information.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Peter-Anthony Pappas whose telephone number is 703-305-8984. The examiner can normally be reached on M-F 10:00am-6:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman can be reached on 703-305-9798. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Peter-Anthony Pappas
Examiner
Art Unit 2671

PAP

ALMIS R. JANKUS
PRIMARY EXAMINER